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09/682,978	11/05/2001	Kellie L. Dutra	BUR920010077	4144

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EXAMINER

MACKEY, TERRENCE M

ART UNIT PAPER NUMBER

1765

DATE MAILED: 06/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/682,978

Applicant(s)

DUTRA ET AL.

Examiner

Terrence Mackey

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1 - 26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 - 26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

**Detailed Action**

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1 – 9, 13, 14, 16, 18 – 20, 22, 24, and 25 are rejected under 35 U.S.C. 102(a) as being anticipated by Collins et al. (6,217,785).

Applicant claims an etching method and reactor for practicing said method wherein the interior surface of the reactor is primed to minimize an undesirable reaction at the surface. The primed interior surface includes a substance that binds with silicon and minimizes Si-F bonding and the formation of a volatile compound or complex. The priming serves to block an etching material selected from the group consisting of fluorine, chlorine, oxygen, argon, bromine, fluorocarbons, and chlorofluorocarbons.

Collins et al. disclose a method of scavenging fluorine in a plasma reaction chamber using a solid source mounted in or added to said chamber. The scavenger reduces the free fluorine radicals present in the plasma. The scavenger may be silicon or a carbon-containing compound such as graphite or silicon carbide (column 4, lines 14-33).

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*Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 11, 17, 23, and 26 are rejected under 35 USC 103 (a) as being unpatentable over Collins et al. (6,217,785) in view of Makoto et al. (JP7201814A).

Applicant claims an etching method and reactor for said method wherein the interior surface of the chamber is primed to minimize an undesirable reaction at the surface in conjunction with periodic cleaning of the reactor.

Collins et al. teach the above described etching method and reactor for said method but does not teach the cleaning of the reactor in conjunction with the priming of the interior surface of the reactor.

Makoto et al. teach the combination of seasoning and cleaning steps for use in a plasma etcher so as to suppress a decrease over time in the etching rate of silicon and oxide films. While Makoto et al. use a gaseous agent in seasoning the plasma etcher, it is the position of the Examiner that the seasoning step of Makoto et al. is analogous to the priming/scavenging described by Collins et al.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the etching process and reactor for said process of Collins et al. to include a

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cleaning step as taught by Makoto et al. to suppress a decrease over time in the etching rate of silicon and oxide films.

Claims 10, 12, 15, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Collins et al. (6,217,785) in view of Tsukada et al. (5,087,341).

Applicant claims an etching method and reactor for said method wherein the interior surface of the chamber is primed with a material that includes cobalt to minimize an undesirable reaction at the surface. The cobalt may be in the form of cobalt-silicon and/or cobalt-fluorine bonds.

Collins et al. teach the above described etching method and reactor for said method but does not teach the use of a scavenger material including cobalt for minimizing an undesirable reaction at the surface.

Tsukada et al. teach a process and apparatus for plasma etching wherein use is made of a cover member which can chemically absorb etchant species and improve the uniformity of the etching process. The cover member may be formed from silicon, silicon carbide, as well as from metal such as aluminum and the like (column 5, lines 6-16).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process and associated apparatus of Collins et al. to use a metal scavenging material such as cobalt to minimize undesirable reaction at the interior surface of the reactor and thus improve the uniformity of etching processes performed in the reactor.

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*Conclusion*

Remaining references cited to show the state of the prior art.

No claim is allowed.

Papers relating to this application may be submitted to Technology Sector 1700 by facsimile transmission. Papers should be faxed to Crystal Plaza 3, Art Unit 1765, using fax number (703) 746--9519. All Technology Section 1700 fax machines are available to receive transmissions 24 hrs/day, 7 days/wk. Please note that the faxing of such papers must conform to the Notice published in the Official Gazette, 1096 OG 30, (November 15, 1989).

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Terrence Mackey whose telephone number is (703) 305-5504. The Examiner can normally be reached Monday - Friday from 7:00 AM - 4:30 PM.

If attempts to reach the Examiner by telephone are unsuccessful, the examiner's supervisor, Ben Uteck, can be reached at (703) 308-3836.

Any inquiry of a general nature or relating to the status of this application should be directed to the receptionist whose telephone number is (703) 308-0661.

TMM

June 18, 2003



ROBERT KUNEMUND  
PRIMARY EXAMINER